



Comparison of Fear of COVID-19 in Medical and Nonmedical Personnel in a Public Hospital in Mexico: a Brief Report

Francisco José Barbosa-Camacho¹ · Benjamín García-Reyna² ·
Guillermo Alonso Cervantes-Cardona³ · Enrique Cervantes-Pérez⁴ ·
Efraín Chavarria-Avila³ · Kevin Josue Pintor-Belmontes¹ ·
Bertha Georgina Guzmán-Ramírez¹ · Aldo Bernal-Hernández¹ ·
Juan Carlos Ibarrola-Peña¹ · Clotilde Fuentes-Orozco¹ · Alejandro González-Ojeda¹ ·
Gabino Cervantes-Guevara^{2,5}

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Abstract

The world is social distancing, and compulsory confinement has caused stress, psychological instability, stigmatization, fear, and discrimination in the general population. In this cross-sectional survey study, we administered the Fear of COVID-19 Scale (FCV-19S) to hospital medical and nonmedical personnel. A total of 1216 participants were surveyed from May 25 to May 29 of 2020. We asked all the staff for their participation in the study, and physical copies of the survey were distributed to the staff willing to participate. All surveys were answered anonymously. We found that the global FCV-19S mean score was 16.4 ± 6.1 , with a significant difference between women and men's scores. Medical students presented higher scores than experienced medical personnel. Additionally, the medical and nursing personnel presented a higher level of fear than hospital staff who did not work directly with COVID-19 patients. Our findings suggest that greater knowledge of medicine or infectious diseases could decrease the overall psychological impact of the pandemic disease.

Keywords COVID-19 · Fear of COVID-19 Scale · Fear · Psychological distress · Fear assessment

✉ Gabino Cervantes-Guevara
gabino_guevara@hotmail.com

¹ Unidad de Investigación Biomédica 02, Hospital de Especialidades del Centro Médico Nacional de Occidente, Instituto Mexicano del Seguro Social, Guadalajara, Jalisco, Mexico

² Departamento de Bienestar Y Desarrollo Sustentable, Centro Universitario del Norte, Universidad de Guadalajara, Km. 191, México 45D No. 23, 46200 Colotlan, Jalisco, Mexico

³ Departamento de Disciplinas Filosófico, Metodológicas E Instrumentales, Centro Universitario de Ciencias de La Salud, Universidad de Guadalajara, Guadalajara, Mexico

⁴ Departamento de Nutrición Clínica, Instituto Nacional de Ciencias Médicas Y Nutrición “Salvador Zubirán”, Mexico City, Mexico

⁵ Hospital Civil de Guadalajara “Fray Antonio Alcalde”, Universidad de Guadalajara, Guadalajara, Mexico

The populations of many countries have been forced to practice social distancing as a result of the pandemic. In combination with disconcerting information, economic losses, and the risk of acquiring the disease, social distancing has caused great stress, psychological instability, stigmatization, fear, and discrimination (Pfefferbaum & North, 2020; Zhou et al., 2020). Health workers, especially those who are the first contact or involved in the diagnosis, treatment, or care of patients with coronavirus 2019 (COVID-19), are among the most exposed and at greater risk of developing psychological distress and mental health symptoms (Tzeng, 2003).

Fear is described as a natural adaptive mechanism towards a perceived threat or real danger, regulated by the amygdala, hippocampus, and prefrontal cortex. These connections create the “fight or flight” response, represented by the parasympathetic nervous system’s inhibition, releasing of epinephrine, and other several neurotransmitters (Fullana et al., 2020). Fear can and has been used as a preventive measure for public health issues. This is often used to persuade the general population’s behavior by implementing messages to arouse fear and warn them of potential risks; this is known as fear appeal. (Tannenbaum et al., 2015). Previous research has presented that the stronger the fear appeal, the greater the fear is perceived by the general population, and the more inclined they would be to following security recommendations. (Witte & Allen, 2000). Similarly, in another study, hope has been found as a driving force to take action (Nabi & Myrick, 2019).

The challenges that health-care personnel face include concerns about infecting family members, the shortage of personal protective equipment, limited treatment options, risk of aggression, and participation in emotional and ethical resource allocation decisions. This has caused an increase in the amount of stress perceived by health-care professionals, in addition to a high frequency of depression, suicidal thoughts, anxiety, insomnia, irritability, frustration, lack of appetite, physical deterioration, vicarious traumatization, substance abuse, and burnout syndrome (Chua et al., 2004; Lai et al., 2020; Li et al., 2020; Mamun & Griffiths, 2020; Pfefferbaum & North, 2020).

As the emotional repercussions of the pandemic increase, medical researchers around the world have devised scales to measure the impact. Previous research has revealed a higher presence of psychological disorders and almost the double the risk of suffering anxiety and depression in first-contact medical personnel compared with nonmedical staff who are unlikely to have contact with patients with COVID-19 (Lu et al., 2020; Soraci et al., 2020; Wang et al., 2020).

It has been reported that fear could lead to higher compliance with public health policies (Harper et al., 2020). As a response to the pandemic, Jalisco’s government implemented various preventive strategies such as the obligatory use of face masks and compulsory social confinement (Gobierno de Jalisco Prensa, 2020). Additionally, the government has an emergency initiative denominated “emergency button.” This initiative states that if Jalisco reports a 50% hospital occupancy or an incidence of 400 new cases in a week, all social and work activities will be stopped, excepting the health, security, and food supply sectors (Gobierno de Jalisco & Secretaría de Salud, 2020). Currently, Jalisco has 17,587 confirmed cases and 2109 deaths due to the COVID-19 pandemic; it is ranked 30 of 32 in the number of cases by 100,00 inhabitants.

The pandemic has encouraged different researchers worldwide to assess the impact of fear and how to address the possible effects on the population (Pakpour & Griffiths, 2020). One of the most used scales is the Fear of COVID-19 Scale (FCV-19S) (Ahorsu et al., 2020). The FCV-19S consists of seven items, and has been shown reliable and valid for assessing fear of COVID-19 among the general population, and it will also be useful to

calm fears of COVID-19 among individuals (Reznik et al., 2020; Sakib et al., 2020; Satici et al., 2020).

In this study, we aimed to identify the prevalence of fear within the health-care and hospital personnel of a public hospital in Mexico. This hospital is one the few hospitals in the region that treats patients without any government or social health-care support. In a previous study, we compared three hospitals, where patients were able to receive social health care, government support, and other means of treatment. We believe the difference between these facilities could alter the responses of hospital staff to COVID-19 patients (Garcia-Reyna et al., 2020).

Methods

Aims

The aims were to identify the level of fear of COVID-19 in a COVID attention hospital in Guadalajara, and determine any differences according to gender, working category, and work shift.

Design

This was a cross-sectional survey study that evaluated fear of COVID-19 using the FCV-19S (Ahorsu et al., 2020). The Spanish version of the FCV-19S, as used in a previous study (Garcia-Reyna et al., 2020), was employed.

Participants

A total of 1216 participants were surveyed from May 25 to May 29 of 2020. Physical copies of the survey were distributed to staff of the Hospital Civil de Guadalajara “Fray Antonio Alcalde” and were answered anonymously. The inclusion criteria for the study were being 18 years or older and be willing to participate in the study. The participants’ demographic information is found in Table 1.

Sample Size

The sample size was calculated using StatCalc software from Epi Info (Centers for Disease Control and Prevention, Atlanta, GA, USA), based on the total number of employees in surveyed hospital of 4363. Inferring that the fear prevalence perceived by the hospital staff would be 25%, with an error of 5% and a confidence level of 99.99%, we calculated the minimum necessary number of surveys to be 901. The sample was obtained by convenience sampling. We visited each department of the hospital and asked the personnel if they would like to take part of our research project. After accepting to participate, we provided them physical copies of the survey, which was answered anonymously, and collected afterwards. Our final sample included 1216 employees.

Table 1 Demographic characteristics of the sample

Demographic characteristics	<i>n</i> (%)
Age (years), (mean \pm SD, range)	37.5 \pm 11 (18–69)
Sex, <i>n</i> (%)	
Female	742 (61%)
Male	474 (39%)
Job categories, <i>n</i> (%)	
Nursing personnel	401 (33%)
Medical personnel	406 (33.4%)
Hospital personnel with direct contact of COVID-19	238 (19.6%)
Administrative personnel	171 (14.1%)
Work shift, <i>n</i> (%)	
Morning shift	630 (51.8%)
Afternoon shift	331 (27.2%)
Mixed shift	138 (11.3%)
Night shift	117 (9.6%)

Data Analysis

The data were analyzed using SPSS software (version 23.0 for Windows; IBM SPSS, Armonk, NY, USA). Descriptive analyses included proportions, means, and standard deviations. The inferential analysis of categorical variables was performed using the chi-squared test or Fisher's exact probability test or variance analysis as appropriate. Student's *t*-test was used to analyze continuous variables. A probability level of $p < 0.05$ was considered significant. The FCV-19S items were analyzed using confirmatory factor analysis (CFA) to determine the adequacy of the model within the sample with the following fit indices: root mean square error of approximation (RMSEA), standardized root mean squared residual (SRMR), Tucker–Lewis index (TLI), confirmatory fit index (CFI), and Akaike's information criterion (AIC). The CFA method of estimation was maximum likelihood. The CFA model was performed using AMOS software (version 24.0 for Windows; IBM SPSS, Armonk, NY, USA).

Results

Scale Reliability

The FCV-19S items' internal reliabilities presented a good measure: $\alpha = 0.847$. We found a high correlation between items 3, 5, 6, and 7, and between items 1, 2, and 4, which suggests that these items could represent the physical and emotional responses to fear. CFA was conducted on the single-factor FCV-19S items. The item loadings ranged from 0.53 to 0.82. The model fit indexes were $\chi^2(7) = 9.23$, $p = 0.236$, confirmatory fit index (CFI) = 0.99, Tucker–Lewis index (TLI) = 0.99, root mean square error of approximation (RMSEA) = 0.017, standardized root mean square residual (SRMR) = 0.008, and Akaike's information criterion (AIC) = 51.23. Afterwards, we performed a two-factor model analysis by dividing the items

into physical and emotional responses. The item loadings for the physical responses ranged from 0.56 to 0.82, while the emotional responses item loadings ranged from 0.65 to 0.77. The fit indices of the model were $\chi^2(8) = 16.17$, $p = 0.040$, CFI = 0.99, TLI = 0.99, RMSEA = 0.029, SRMR = 0.013, and AIC = 56.17. The CFA factor loadings are found in Table 2.

Fear of COVID-19

The sample's FCV-19S mean score was 16.4 ± 6.1 (median 16), 94 of the participants (7.7%) presented the minimum score of 7, while only 7 participants (0.6%) presented the maximum score of 35. There was a significant difference between the scores for women (17.22 ± 6.03) and men (15.34 ± 6.08); ($t(1212) = -5.27$, $p < 0.001$). Fear scores were higher in medical students (17.68 ± 5.41) than in medical staff (16.42 ± 5.70), although this difference was not statistically significant. The comparison between the scores on each item by gender and academic grade is found in Table 3.

The sample was divided into four work categories: medical personnel, nursing personnel, hospital staff with direct contact with COVID-19 patients, and administrative personnel. Across the four work categories, medical personnel had the highest fear scores (16.64 ± 5.66), followed by nursing personnel (16.47 ± 6.38), hospital staff with direct contact with COVID-19 patients (16.35 ± 6.40), and administrative personnel (16.33 ± 6.13). The work shift with the highest scores was the morning shift (16.73 ± 6.12), followed by the mixed shift (16.54 ± 5.56), afternoon shift (16.21 ± 6.29), and finally the night shift (15.91 ± 6.19). A one-way between-groups analysis of variance (ANOVA) was conducted to compare the fear scores. There was no significant effect of work category or work shift on the fear scores.

The mean physical responses score for the sample was 2.08 ± 0.93 , and the mean score for emotional responses was 2.71 ± 1.01 . There was a significant difference in the physical responses scores between women (2.20 ± 0.94) and men (1.88 ± 0.88); ($t(1212) = -5.92$, $p < 0.001$). We also found an statistically significant differences between the scores of emotional responses to fear between women (2.79 ± 0.97) and men (2.59 ± 1.07); ($t(1212) = -3.30$, $p < 0.001$). Similarly, the physical (2.9 ± 0.88) and emotional (2.22 ± 0.85) response scores from the medical students were higher than those of the medical staff (2.79 ± 0.96 and 2 ± 0.88 respectively), although these differences were not statistically significant.

Table 2 CFA factor loadings

Items	CFA factor loadings	
	Single-factor model	Two-factor model
1. I am most afraid of coronavirus-19	.53	.65
2. It makes me uncomfortable to think about coronavirus-19	.53	.68
3. My hands become clammy when I think about coronavirus-19	.56	.56
4. I am afraid of losing my life because of coronavirus-19	.64	.77
5. When watching news and stories about coronavirus-19 on social media, I become nervous or anxious	.82	.82
6. I cannot sleep because I am worrying about getting coronavirus-19	.61	.61
7. My heart races or palpitates when I think about getting coronavirus-19	.75	.75

Table 3 FCV-19S scores by gender and academic grade

FCV-19S items	Female mean scores		Male mean scores		Medical students mean scores	Medical personnel T scores
	Female mean scores	T scores	Male mean scores	T scores		
1. I am most afraid of coronavirus-19	2.90 ± 1.18	-3.06 **	2.69 ± 1.24	-3.06 **	3.22 ± 1.09	2.98 ± 1.16
2. It makes me uncomfortable to think about coronavirus-19	2.68 ± 1.22	-2.73 **	2.48 ± 1.29	-2.73 **	2.58 ± 1.12	2.61 ± 1.22
3. My hands become clammy when I think about coronavirus-19	1.93 ± 1.07	-3.02 **	1.74 ± .99	-3.02 **	1.98 ± 1.02	1.68 ± .93
4. I am afraid of losing my life because of coronavirus-19	2.78 ± 1.35	-2.12 *	2.61 ± 1.14	-2.12 *	2.95 ± 1.27	2.78 ± 1.32
5. When watching news and stories about coronavirus-19 on social media, I become nervous or anxious	2.61 ± 1.28	-6.51 ***	2.13 ± 1.19	-6.51 ***	2.65 ± 1.17	2.42 ± 1.23
6. I cannot sleep because I am worrying about getting coronavirus-19	2.04 ± 1.09	-4.18 ***	1.78 ± 1.03	-4.18 ***	1.95 ± 0.94	1.90 ± 1.05
7. My heart races or palpitates when I think about getting coronavirus-19	2.24 ± 1.21	-5.19 ***	1.88 ± 1.11	-5.19 ***	2.30 ± 1.15	2.01 ± 1.14

t values obtained by Student's t test. Degrees of freedom 1212

* $p < 0.05$; ** $p < 0.010$; *** $p < 0.001$

One-way between-group ANOVA tests were also conducted to compare the fear reactions between work categories and work shifts. There was no significant effect of the four work categories on fear. We found differences in physical responses to fear and emotional responses to fear scores across work shifts. These were significant for emotional responses [$F(3, 1212) = 3.27, p < 0.010$], but not for physical responses. Post hoc comparisons using Tukey's honestly significant difference test indicated that the mean scores for emotional responses to fear from the morning shift (16.73 ± 6.12) were significantly different from those of the afternoon shift (16.21 ± 6.9). However, the scores of the mixed and night shifts did not significantly differ from the other work shifts. After adjusting the test for multiple comparisons using the Bonferroni test, no statistically significant differences were found between work shifts.

Discussion

The fear of being infected by SARS-CoV-2 has become a burden in the everyday lives of people around the world. As a result, efforts have been made by experts worldwide to evaluate the effect of the stress, anxiety, depression, and fear towards this pandemic (Dyer & Harris, 2020; Rajkumar, 2020; Troyer et al., 2020). Similarly to the general population, health-care personnel face a series of stressors alongside the obligatory confinement and the underlining stress of the pandemic such as extended hospital hours, absence of protective equipment, isolation from their families and loved ones, and fear of contagion. As a result, the prevalence of sleeping disorders, depressive disorders, suicide ideation or intent, and substance abuse has increased (Lai et al., 2020; Mamun & Griffiths, 2020; Pfefferbaum & North, 2020; Shechter et al., 2020). The most prominent mental disorder studied in physicians is anxiety disorders; perhaps the constant exposure to the disease can wear out the hospital personnel resilience (Hu et al., 2020; Monterrosa-Castro et al., 2020a, b). Some emergency medicine physicians even report to have changed their behavior towards their family and loved ones, to avoid contagion (Rodriguez et al., 2020).

The present hospital houses many nursing and medical students as it is part of a university campus. We expected to find a difference between medical students starting their clinical practice and medical personnel with experience in treating patients. One possible reason is that the inexperienced medical personnel did not know how to respond to a crisis of this nature, whereas trained medical staff, while not experts in pandemic events, still have years of medical practice experience. However, the differences we found between students and practitioners were not statistically significant.

Similar to our previous study, the nursing medical personnel presented a higher mean score than general and administrative personnel. Medical personnel presented higher scores among the four work categories, probably due to the presence of medical students in the sample. We found that the morning and afternoon work shifts produced higher scores, probably due to hospitals having a busier workflow during the day than at night. In addition, our sample showed consistent results in the physical and emotional responses to fear scores, as presented previously (Garcia-Reyna et al., 2020).

The FCV-19S score in our hospital sample was lower than in other populations around the world (Ahorsu et al., 2020; Mamun & Griffiths, 2020; Reznik et al., 2020; Sakib et al., 2020; Satici et al., 2020; Soraci et al., 2020), and in other studies in the same region (Garcia-Reyna et al., 2020), as shown in Table 4. This could be because previous studies surveyed the general population, whereas our study focused on medical and nonmedical personnel. Perhaps having

Table 4 Comparison of FCV-19S scores in different regions

FCV-19S items	Ahorsu et al. (<i>n</i> = 717)	Reznik et al. (<i>n</i> = 850)	Soraci et al. (<i>n</i> = 249)	Sakib et al. (<i>n</i> = 8550)	García-Reyna et al. (<i>n</i> = 2860)	Present study (<i>n</i> = 1216)
1. I am most afraid of coronavirus-19	3.48 ± 1.14	2.82 ± 1.00	3.44	3.62 ± 1.04	3.18 ± 1.22	2.82 ± 1.21
2. It makes me uncomfortable to think about coronavirus-19	4.01 ± 0.84	3.31 ± 1.11	2.94	3.52 ± 1.06	2.95 ± 1.23	2.60 ± 1.25
3. My hands become clammy when I think about coronavirus-19	3.76 ± 0.88	1.70 ± 0.76	1.50	2.49 ± 1.13	2.32 ± 1.19	1.86 ± 1.25
4. I am afraid of losing my life because of coronavirus-19	4.24 ± 0.90	2.62 ± 1.14	2.41	2.93 ± 1.22	3.11 ± 1.36	2.71 ± 1.37
5. When watching news and stories about coronavirus-19 on social media, I become nervous or anxious	3.53 ± 1.07	3.17 ± 1.08	2.93	3.53 ± 1.07	2.78 ± 1.26	2.42 ± 1.27
6. I cannot sleep because I am worrying about getting coronavirus-19	4.11 ± 0.81	1.53 ± 0.66	1.56	2.41 ± 1.11	2.41 ± 1.23	1.94 ± 1.07
7. My heart races or palpitates when I think about getting coronavirus-19	4.26 ± 0.75	2.07 ± 1.00	2.10	2.88 ± 1.24	2.57 ± 1.26	2.10 ± 1.18

Data is presented as mean scores and standard deviations

greater knowledge of the disease's effects on health minimizes the fear of infection. This is a concern, because medical personnel placing less importance on the disease may result in complacency. In contrast, in a Colombian study, the authors report a high level of anxiety in physicians, and although presented differently, the health personnel surveyed presented a high score in the FCV19-S. (Monterrosa-Castro et al., 2020a, b) These results are interesting as, although both studies were performed in Latin populations, the Colombian study presented a higher fear and anxiety prevalence; this could be explained by the pandemic's local characteristics, such as the number of cases and hospital occupancy.

Each day the government presents an update on the pandemic situation in the form of number of confirmed cases, suspected cases and number of victims of COVID-19. Mexico has surpassed 579,914 confirmed cases, has a reported mortality rate of approximately of 11%, and is one of the countries with the lowest number of diagnostic tests (0.03 tests per 1000 people per day). As of May, there were 8544 confirmed cases within health-care personnel, and 111 deaths due to COVID-19 (Gobierno de México & Secretaría de Salud, 2020a, b; Hasell et al., 2020; Vega, 2020). However, in September, the number of medical and nonmedical personnel confirmed cases skyrocketed to 97,632 cases, and the number of deaths has surpassed 1000 cases, ranking Mexico in the first place in the world in health personnel deceased by COVID-19. (El Financiero, 2020).

We hypothesize that the lack of diagnostic testing may create a sense of false confidence within the general and medical population, and lower the overall stress and fear caused by the pandemic. However, this means that a surge of new cases and deaths by COVID-19 may be at hand.

There is a worldwide shortage of protective equipment for hospital workers, and although the voices of the crowds may sound elevating, they would not ease the fear and anxiety that hospital workers experience each time they enter their workplace. Experiencing the everyday horror of the virus, the death toll, and the loss of medical staff and others from the frontline further elevates stress levels, adding further tension to this high-pressure job. There is also the fear of working next to colleagues who might be COVID-19 positive.

The availability of proper personal protective equipment, knowledge on how to use it, and ongoing training on the disease's symptoms and evolution for medical and non-medical hospital personnel could decrease this false sense of confidence and motivate them to be more aware of the severity of the global situation.

One limitation of this study is that it is based on only one center's responses in hospital personnel. Although similar to another report in the same region (Garcia-Reyna et al., 2020), the results could not be generalized to other samples but could serve as a preliminary study to explore the Mexican or Latin healthcare and hospital personnel's mental health panorama. We encourage the medical community to research the effects of fear and anxiety in healthcare personnel, as having more knowledge on how to prevent more damage to mental health is vital for all of us to flourish during and after the pandemic.

Conclusions

The level of fear reported in the surveyed hospital was less than that reported in other hospitals in the region. Our findings show significant differences in fear between men and women, as women reported higher scores to fear in both physical and emotional responses. The medical students in our sample reported a higher level of fear than medical personnel did. Additionally, the medical and nursing personnel presented a higher level of fear than

did the hospital staff who did not work directly with COVID-19 patients. Our findings suggest that greater knowledge of medicine or infectious diseases could decrease the overall psychological impact of the pandemic disease.

Declarations

Ethics Approval Verbal consent was obtained from each participant. The surveys were completed anonymously to guarantee the confidentiality of each of the participants. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the 1975 Declaration of Helsinki as revised in Fortaleza, Brazil 2013. The Local Ethics Committee authorized the study protocol with the register number: R-037/2020.

Conflict of Interest The authors declare no competing interests.

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